Message

From: Lin, James [lin.james@epa.gov]
Sent: 10/29/2019 12:42:06 PM
To: Lin, James [lin.james@epa.gov]
Subject: FW: Oryzalin Text

Methods and results from degradation studies in subsoils, unsaturated zone, were reviewed for mecoprop, 2,4-D, atrazine, alachlor, aldicarb, carbofuran, linuron, oxamyl, methomyl, MCPA, dichlorprop, monochlorprop, dichlorphenol, TCA, parathion, metribuzin, metolachlor and fenamiphos.

Most of the investigations were laboratory studies where small soil samples were sieved and pesticides were added in concentrations from 0.5-5 $\mu g.g^{-1}$. A few of the studies mentioned the importance of working with undisturbed samples; another few studies used isotope-labelled pesticides which made it possible to work with concentrations as low as 0.02 $\mu g.g^{-1}$.

Subsoil samples were characterized according to factors as microbial activity, soil temperature, water content, oxygen content, concentration of pesticide, pretreatment of the soil and soil type, factors considered to have influence on degradation of pesticides. Chemical hydrolysis was considered to be the most dominant pathway in the degradation of aldicarb in subsoil in one of the published papers; all other investigations considered the degradation of pesticides in subsoil to be primarily microbiological. Only a few of the investigations measured the biomass or biological activity of the subsoil samples.

Key Words: Subsurface soil, unsaturated zone, pesticides, degradation, methods, review

From: Wente, Stephen <Wente.Stephen@epa.gov>
Sent: Tuesday, October 29, 2019 8:20 AM
To: Lin, James <lin.james@epa.gov>
Subject: Oryzalin Text

In the current conceptual model, biotic degradation is assumed to only occur in the top onemeter of soil with the biotic degradation rate linearly decreasing to zero at one meter. This assumption is consistent with precedents established by the European Union (EU) Forum for Co-ordination of pesticide fate models and their Use (FOCUS) conceptual groundwater model, and the United States Department of Agriculture (USDA) Root Zone Water Quality Model (RZWQM) model, as well as others. Below one-meter, subsurface degradation is assumed to occur only by hydrolysis. While this modeling assumption is valid in the absence of additional data to better understand what the subsurface rate might be for oryzalin, biotic degradation has been well documented to occur at depths lower than one meter (Fomsgaard, 1995) for many other pesticides. Again, with the length of time oryzalin was simulated in modeling, it is possible that additional degradation will occur below one meter.

Fomsgaard, I. S. 1995. Degradation of pesticides in subsurface soils, unsaturated zone - a review of methods and results. *International Journal of Environmental Analytical Chemistry, 58*(1-4), 231-245.

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